



The role of plants in the effects of global change on nutrient availability and stoichiometry in the plant-soil system

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Abstract:

The impact on nitrogen (N) and phosphorus (P) cycles of human activity is a growing concern and has several causes and consequences (MacDonald et al., 2011; Peñuelas et al., 2012; Sardans et al., 2012b). Carbon (C) inputs by human CO₂ emissions and N inputs from diverse human-driven sources are continuously increasing (Peters et al., 2011; Peñuelas et al., 2012). On the other hand, anthropogenic biospheric inputs of P are increasing much less than emissions of N and P (Peñuelas et al., 2012). These changes impact all ecosystems, including cropland (MacDonald et al., 2011), and seem to lead to shifts in C-N-P ratios and balances (Mackenzie et al., 2002; Peñuelas et al., 2012), with significant impacts on the structures and functions of ecosystems through effects on growth rates and on the competitive abilities of different species (Sterner and Elser, 2002; Peñuelas et al., 2012). Furthermore, increased warming, drought, and concentrations of atmospheric CO₂ also change the N and P contents and stoichiometry of plants (Reich et al., 2006; Funk and Vitousek, 2007; Elser et al., 2010; Rivas-Ubach et al., 2012) and, therefore, can indirectly impact soil processes and nutrient availability and stoichiometry. These increases also influence ecosystemic structures and functions and the capacity of Earth to balance its levels of CO₂, given the importance of nutrients in the efficiency of plants to take up CO₂ (Vicca et al., 2012).

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3510107>

Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Researcher

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Food/Water Security

Climate Change and Human Health Literature Portal

Food/Water Security: Agricultural Productivity

Geographic Feature: 

resource focuses on specific type of geography

None or Unspecified

Geographic Location: 

resource focuses on specific location

Global or Unspecified

Health Impact: 

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: 

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: 

format or standard characteristic of resource

Review

Timescale: 

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: 

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content